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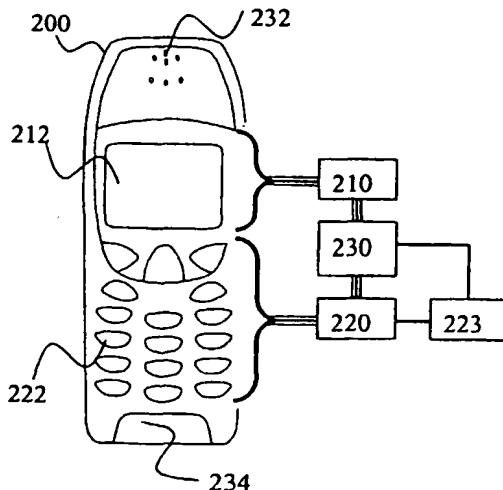
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

- (54) Title:** METHOD FOR INTERMEDIATE UNLOCKING OF A KEYPAD ON A MOBILE ELECTRONIC DEVICE



(57) Abstract: There is disclosed a method and a device for of changing the input states of an electronic device, the device comprising input means and being capable of carrying out user operations, the input states comprising a locked state, where the use of the input means is significantly restricted, and an unlocked state, where the use of the input means is not restricted, the locked state being enterable by a locking input, and the unlocked state being enterable by an unlocking input, characterised in that the input states further comprise an intermediate unlocked state; which method comprises the steps of: - entering said intermediate unlocked state based on user input; - detecting the termination of a user operation in said intermediate unlocked state, the user operation being other than said locking input; and entering said locked state, in response to said detection. There is also provided an input controller, a keypad and a mobile electronic device implementing these features.

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In Response to the Official Communication pursuant to Rule 66 PCT Dated January 19, 2004:

I. New Documents

Enclosed please find a set of amended claims on the basis of which the further Examination shall be carried out.

The new claim 1 is disclosed in pending claims 1, 3, and 6 and is further supported by the specification, e.g. on page 2, line 31, page 5, lines 1 to 13, page 6, lines 7-9, and the description of figure 3B, on page 12, lines 18 to 32.

The new claim 2 is disclosed in pending claim 2.

The new claims 3 and 4 are disclosed in pending claims 4 to 5.

The new claims 5 and 6 are disclosed in pending claims 8 and 9.

The new claim 7 is disclosed in the pending claims 13, 3, and 6 and in the specification e.g. on page 5, lines 1 to 13 and the description of figure 3B, on page 12, lines 18 to 32.

The new claims 8 and 9 are disclosed in pending claims 14 and 15.

The pending claims 3, 6, 7, and 10 to 12 have been deleted.

It is requested to defer the adaptation of the specification to the amended claims until a set of claims that are regarded as being patentable by the examiner has been agreed on. It is requested to also defer the amendments of the introductory part of the specification to cite relevant background art documents.

The new claims comprise actually only a single independent method claim and only a single independent device claim. The number of independent claims should therefore clearly indicate the subject matter for which protection is sought. The independent claims comprise the limitations of former claim 6 and should therefore be regarded as being clear. The device claims have been reformulated to more clearly define the device claims in apparatus terms. The independent claims are drafted in two-part form.

II. The Invention as Claimed

The present invention provides a method and a device for providing an intermediate locked state in addition to standard unlocked operational states and standard locked hold states. The present invention is based on the idea to facilitate the operation of an electronic device by reducing the administrative unlocking and locking inputs by further providing an intermediate unlocked state. The method of the invention is based on entering

said intermediate unlocked state based on an intermediate unlocking input, detecting the termination of a user operation in said intermediate unlocked state, wherein the user operation is other than said locking input, wherein said termination of a user operation comprises completing the user operation, canceling the user operation, and detecting an unexpected user input; and entering said locked state, in response to said detection.

The present invention also provides an electronic device that is configured to be able to enter an unlocked state or an intermediate unlocked state from a locked state in response to different user inputs.

III. State of the Art

The Examiner denies novelty and the presence of an inventive step of the subject matter of original claims 1 to 15 in view of five references.

D1: User's Guide, [Online] XP 002218693 <URL: not longer available>

D2: Patent abstracts of Japan vol. 1998, no. 02, 30 January 1997 & JP 09 261336 A

D4: EP-A 0 768 786 (Nokia Mobile Phones LDT.) 03 October 1997

D5: EP-A 0 453 089 (Technophone LDT.) 16 April 1991

D6: US-A 5 864 765 (Barvesten Mats O) 26 January 1999

A document D3 has not been cited in the written opinion.

Document D1 represents an abstract of a user instruction manual that discloses keypad lock feature. D1 discloses that a keypadlock helps to avoid accidental dialing, and that an

icon in shape of a key is displayed if the keypad is locked. D1 especially discloses that a call to an international emergency number can be made even if the keypad is locked. D1 does not disclose that the keypad is locked again after the termination of such an emergency call. D1 also discloses that the keypad can be locked manually or that an automatic keylock can be activated. With an activated automatic keylock the keypad will be locked if no keys are pressed for a period of 25 seconds.

The document D2 discloses a kind of hardware solution enabling the acceptance of an incoming phone call on a phone with a key protection lid. The document suggests to provide a key under a key protection lid that is operated when the lid is closed. That is, it is not clear how a key covered with a key protection lid can be operated by user input. The document D2 does not disclose if the key under the key protection lid is operated by a user input or by the lid itself. This means, the disclosure of document D2 as such is not clear.

The documents D4 to D6 are cited in the search report only as general state of the art and are also not discussed in detail in the written option. The examiner only refers to these documents in a general statement, saying that these documents disclose different aspects of an automatic keylock procedure for a telephone apparatus.

The document D4 discloses a way for simplifying the locking procedure of a mobile communication device by using a defined input sequence or input pattern of a call-terminating key to activate the keylock. D4 does not disclose any automated keylock functionality nor discloses any other operational states than fully locked or fully unlocked keyboards.

The document D5 discloses a keylock feature that is based on a sequence of keystrokes of keys that in the unlocked state each provide a second functionality. That is, D5 provides a solution to avoid a dedicated lock or hold key, by using a kind of software solution. Similar to D4, D5 does also not disclose any automated keylock functionality nor discloses any other operational states than fully locked or fully unlocked keypads.

The document D6 discloses in detail a time-based autolocking feature like it is already disclosed for example in D1. Similar to D4 and D5, D6 does only disclose two operational states which are fully locked or fully unlocked keyboards (with activated time based keylock).

The last document cited in the search report (but not in the written opinion), the user's guide to Nokia 6510 (XP 002218694) basically discloses the same features as the Document D1: A time based autolocking feature, the possibility to accept incoming calls even with a locked keyboard, and a possibility to dial emergence numbers even when the keylock is active. The only additional disclosure resides in the possibility to individually select the length of the period until the autolocking is performed.

IV. Novelty

The present invention is based on the idea to facilitate the operation of an electronic device by reducing the administrative unlocking and locking inputs by further providing an additional intermediate unlocked state. The intermediate unlocked state can only be entered from said locked state based on or in response to an intermediate unlocking input. The device re-enters the locked state from said intermediate unlocked state upon the detection of completing a user operation, canceling a user operation, or detecting an unexpected user input. According to the present invention there are provided two different unlocking sequences in the locked state. This feature is not disclosed in any of the cited documents.

In contrast to the autolocking feature as disclosed in D1 or D6 the present invention provides two different unlocking sequences. Even if the unlocked state with an activated autolocking feature would be regarded as a kind of intermediate unlocked state, it is to be noted that there is only a single unlocking sequence to enter the unlocked state with or without activated autolocking feature. That is, the document D1 discloses two different

locked states: a first with a deactivated autolocking feature and a second with an activated autolocking feature. Actually D1 only discloses a single unlocking input. The autolocking feature can only be activated an unlocked state (as the user-input menu can not be entered due to locked keys).

As the documents D1 and D6 do not disclose different and unambiguous unlocking and intermediate unlocking input sequences the present invention is novel over D1 and D6.

The document D2 describes in the problem to be solved is to enable a prescribed functional operation without performing the cancel operation of a key lock mode when performing the prescribed functional operation by operating a 2nd key, with which no operation is accepted in the key lock mode after a 1st key is operated for accepting operations in the key lock mode. Thus the document D2 is provided to enable prescribed operations. A prescribed operation may best be described as a user reaction to an event of the telephone device. In the following abstract this prescribed operation is specified as the taking of an incoming telephone call. D2 discloses only that a single key, which is located outside of a key protection lid (the second key) is unlocked. When interpreting the disclosure, D2 enables a user of a flip-type cellular phone to accept an incoming phone call (a prescribed functional operation) after opening and a flip-type key cover and pressing a single key to unlock a second key (i.e. the speech key or clearing key) for operation. D2 does not disclose that this principle may also be applied to any kind of mobile device without any key protection lids. The document D2 does not disclose that a user can also perform non-prescribed operations.

As the present claims 1 and 8 enable a generally unlocked state not only for prescribed operations but also for voluntary, spontaneous and non-prescribed user input and not only user reactions, the new claims 1 and 8 are novel over the disclosure of D2.

The document D4 discloses a simplified locking procedure with only two operational states with fully locked and fully unlocked keyboards, respectively.

The document D5 discloses a solution to avoid a dedicated lock or hold key, by using a kind of software solution, but discloses only two operational states with fully locked and fully unlocked keyboards, respectively.

As the documents D4 and D3 do not disclose a third possible operational state, such as an intermediate unlocked state, the new claims 1 and 8 are novel over D4 and D5.

V. Inventive Step

In order to assess the presence or absence of an inventive step, the disclosures of the state of the art documents are discussed alone and in combination with the closest prior art document D1. D1 has been selected as closest prior art document as it has been cited in the search report as an “X” document and the Examiner has based his argumentation mainly on this document.

D1 as such discloses an option to activate a time based autolocking feature that can put the device in a keylocked state after a certain time has passed since the last user input. That is, the device of D1 provides a functional protection to prevent inadvertent waste of battery power and inadvertent dialing. The device of D1 effectively reduces the number of input sequences to a minimum, as a user only has to memorize a single unlocking sequence, as the locking procedure may be performed automatically. The disclosure of D1 further provides another minimum of unlocking sequences to be memorized, as an international emergency call can be made without unlocking the device. Starting from D1 with its simplified operability, it is not clear why a user should be burdened with another unlocking sequence or unlocking input to enable only a single user operation. The aim of the developers of the device of D1 is to reduce the number of decisions to be made, when a user intends to use the device. Therefore it is not clear why an artisan should intend to provide an additional unlocking sequence, if an improvement of the operability is not evident. That is, the document D1 provides a sufficient and intuitive operability to a user.

An additional intermediate unlocking sequence would complicate the use of the device disclosed in D1, therefore the disclosure of D1 is regarded as teaching away from the teaching of the present independent claims 1 and 8.

The document D2 describes a simplified way to short-cut the taking of an incoming telephone call, by employing a one-key speech-key or clearing-key unlock. D1 does not disclose or suggest how the principle of the possibility to be able to take an incoming phone call faster can also be applied to other implementations of user inputs that are not prescribed. D2 especially fails to disclose that more than a single key may be “unlocked” after the operation of the first key. It is not clear which other prescribed operations other than taking an incoming phone call may occur on a mobile terminal. Thus, D2 does not suggest to apply the one-button speech-key unlocking feature also to other input operations, and therefore the present claims are not suggested by D2 alone.

When an artisan would have to combine the disclosure of D1 and D2 to improve an existing mobile device, the artisan would just discard the disclosure of D2, as the possibility to take an incoming phone call even in the locked state makes the one-key unlock approach of D2 pointless. Why should an artisan try to implement a two key call taking procedure (on key for unlocking and one key for taking) when the single-key approach (of D1) is even more intuitive for a user and applicable to any types of phones with and without key protection lids?

The disclosure of the document D4 discloses a simplified locking procedure with only two operational states with fully locked and fully unlocked keyboards, respectively. It is not clear how the disclosure of document D4 can suggest an artisan to implement an intermediate unlocked state on the basis of an improved locking sequence. Thus, the document D4 alone can not suggest the two different unlocking inputs, and thus the subject matter of the present claims is to be regarded as inventive over D4 alone.

A combination of D1 and D4 is possible and would be implemented by using (or adding) the locking sequences or patterns of D4 in a device according to D1 to replace (or add another) locking sequence. The combination of D1 and D4 would also not teach an artisan to implement an additional intermediate unlocking sequence or an additional intermediate unlocking state to the device of D1. Thus, the subject matter of the present claims is not suggested by a combination of D1 and D4, and therefore the present invention is also to be regarded as inventive over this combination.

The document D5 discloses a software implementation to employ an input sequence of two different keys in a defined succession to avoid a dedicated lock or hold key. D5 does only disclose two operational states with a fully locked keypad or a fully unlocked keypad. D5 does not provide any indications that more than the known fully locked or fully unlocked states can be provided. Thus, the subject matter of the present invention can not be suggested by D5 alone.

An artisan would not be able to combine the disclosures of D5 and D1 as D1 alone already discloses a two key locking sequence 'Keylock menu' followed by 'yes' and a two-key unlocking sequence of keys "left" followed by "yes". That is, the technology already has combined the features of the cited documents which is the best indication for their combinability and for the fact that the combination of these documents does not suggest an artisan the subject matter of the present invention.

Thus the subject of the claims of the present invention is to be regarded as comprising an inventive step over the combination of D1 and D5.

The disclosure of the document D6 the time based autolocking feature, alone can not suggest the subject of the present invention, as the document D6 discloses only a single locked and a single unlocked state, as D6 does not disclose any alternative operational state than locked and unlocked with activated autolock.

An artisan would not be able to combine the disclosures of D6 and D1, as D1 alone already discloses a time based autolocking feature that can be activated from the settings menu. The technology already has combined the features of the cited documents which is the best indication for the fact that the combination of these documents does not suggest an artisan the subject matter of the present invention.

VI. Requests

In view of the above arguments it is assumed that the Examiner's objections have been overcome, and it is therefore respectfully submitted that the new set of claims 1 to 9 is acknowledged as inventive. Therefore, issuance of a favorable IPER is kindly requested.

Dr. Thomas Kurig
(Patent Attorney)

Enclosures:

New set of claims (3-fold)

Application number: PCT/IB 02/00623
Applicant: Nokia Corporation et al.
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New Claims

1. Method of changing the input states of an electronic device, the device comprising input means and being capable of carrying out user operations, the input states comprising a locked state (2), wherein the use of the input means is significantly restricted, and an unlocked state, wherein the use of the input means is not restricted, the locked state (2) being enterable by a locking input, and the unlocked state being enterable by an unlocking input, characterized in that the input states further comprise an intermediate unlocked state (12); which method comprises:
 - entering said intermediate unlocked state (12) based on an intermediate unlocking user input which is different from the unlocking input required for entering the unlocked state;
 - detecting the termination of a user operation in said intermediate unlocked state (12), the user operation being other than said locking input and being one of the group: completing the user operation, cancelling the user operation, and detecting an unexpected user input; and
 - entering said locked state (2), in response to said detection.
2. Method according to claim 1, wherein the user operations that can be carried out in the intermediate unlocked state (12) are restricted to a subgroup of the user operations that can be carried out in the unlocked state.
3. Method according to anyone of the preceding claims, wherein said detection of termination of the user operation is defined by a predetermined number of input operations.
4. Method according to anyone of the preceding claims, wherein said detection of termination of the user operation is time related.
5. Computer program for locking of an electronic device from an intermediate

unlocked state (12), comprising program code means for carrying out the steps of anyone of claims 1 to 4 when said program is run on an electronic device.

6. Computer program product comprising program code means stored on a computer readable medium for carrying out the method of anyone of claims 1 to 4 when said program product is run on an electronic device.
7. Mobile electronic device, having input means and different user input states, the input states comprising a locked state (2), where the use of the input means is significantly restricted, and an unlocked state, where the use of the input means is not restricted, said locked state (2) being enterable by a locking input, and said unlocked state being enterable by an unlocking input, characterised in that,
 - said input states further comprise an intermediate unlocked state (12), and in that, the mobile electronic device comprises:
 - means adapted to enter the intermediate unlocked state (12) based on an intermediate unlocking user input which is different from the unlocking input required for entering the unlocked state;
 - means adapted for detecting the termination of a user operation in said intermediate unlocked state (12), the user operation being other than said locking input and being one of the group: completing the user operation, cancelling the user operation, and detecting an unexpected user input; and
 - means adapted to enter said locked state (2) in response to said detection.
8. Mobile electronic device according to claim 7, further comprising a memory to store locking, unlocking and intermediate unlocking inputs.
9. Mobile electronic device according to claim 7 or 8, further comprising a timer.